

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte HEIDI PETERSON and JUNGWOO LEE

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Appeal No. 2000-1499  
Application No. 08/825,474

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ON BRIEF

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Before HAIRSTON, KRASS and LALL, Administrative Patent Judges.  
KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-4, 6-9, 11-14, and 16-18.<sup>1</sup> Claims 5, 10 and 15 have

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<sup>1</sup>We note that the examiner has not included claims 13 and 17 in any statement of rejection nor has the examiner indicated these claims to be allowable. We treat them as being rejected under 35 U.S.C. 103 since appellants consider them to be rejected and the examiner apparently is treating them as being rejected since the examiner responds to appellants' arguments in this regard.

been indicated by the examiner to be directed to allowable subject matter and are not before us on appeal.

The invention is directed to the optimization of coding of images or sequences of images. More particularly, the invention relates to the selection of image encoding parameters in accordance with a perceptual metric derived from analyzing the contents of the image being coded. One or more encoding parameters is selected as a result of comparing an original image to a reconstructed image and processing the comparison results using a quantitative perceptual difference metric. This metric represents the fidelity of the reconstructed image and is used to update the encoding parameters to optimize the coding of the image.

Distortion in the decoded video for a prescribed bit rate is minimized by the use of a fidelity measure that is based on human perception. That is, what is used is a perceptual metric using a "just noticeable difference" (JND) map where the perceptual metric represents how a human eye would perceive a reconstructed image.

Representative independent claim 1 is reproduced as follows:

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1. Apparatus for adjusting an encoding parameter of an image encoder to optimize encoder performance comprising:

a perceptual metric generator for determining a perceptual metric using a just noticeable difference map that represents the fidelity of an encoded image, where said perceptual metric is representative of a prediction as to how a human eye would perceive a reconstructed image of said encoded image; and

an encoder parameter selector, coupled to said perceptual metric generator, for selecting a value for said encoding parameter in response to said perceptual metric.

The examiner relies on the following references:

Furukawa et al.	4,689,672	Aug. 25, 1987
Aravind et al.	5,214,507	May 25, 1993
Yamaoka	5,357,584	Oct. 18, 1994
Tabatabai et al.	5,686,964	Nov. 11, 1997
		(filed Dec. 4, 1995)

Claims 1-4, 6-9, 11-14 and 16-18 stand rejected under 35 U.S.C. 103. As evidence of obviousness, the examiner cites Yamaoka with regard to claims 1-3, 7, 8, 12 and 16, adding Aravind with regard to claims 4, 9 and 14. With regard to claims 6, 11 and 18, the examiner cites Yamaoka in view of either one of Tabatabai or Furukawa. Apparently, claims 13 and 17 are intended to be grouped with claims 4, 9 and 14 in being rejected over Yamaoka in view of Aravind.

Reference is made to the brief and answer for the respective positions of appellants and the examiner.

OPINION

We REVERSE.

The examiner has not presented a prima facie case of obviousness, in our view, because a portion of the examiner's case is based on speculation as to what is disclosed or suggested by Yamaoka.

Each of the independent claims 1, 7 and 12 requires, in some way, a perceptual metric generator, using a just noticeable difference map representing the fidelity of the image wherein the perceptual metric represents a "prediction as to how a human eye would perceive a reconstructed image of said encoded image."

Yamaoka causes a change in a compression factor in accordance with a "block noise." While Yamaoka does not appear to disclose the claimed "perceptual metric," the examiner contends that Yamaoka does, indeed, suggest this claim limitation through the recitation of "block noise" because "at least noise is unquestionably perceptual, and is the metric by which Yamaoka uses for compression" [answer-page 8]. The examiner further

explains that since Yamaoka discloses, at column 3, lines 44-56 and column 5, lines 19-24, that block noise is a "visual problem," this indicates a "humanly perceptible" trait. The examiner further explains that if it is understood that Yamaoka does not provide for this feature, then "official notice" is taken of using humanly perceptible metrics [answer-page 8].

Merely because Yamaoka may indicate that "block noise" may provide a visual problem, this does not teach or suggest the use of a perceptual metric as representative of a prediction as to how a human eye would perceive a reconstructed image of an encoded image.

Moreover, we do not find persuasive the examiner's reliance on "official notice." It is a reversible error when an examiner judicially notices a feature as being old in the art and such is challenged and the examiner fails to cite the well known thing on which he/she relies. Ex parte Nouel, 158 USPQ 237 (PTO Bd. Of App 1967). As is apparent by their arguments, appellants clearly challenge this finding of "official notice" but the examiner has failed to provide evidence of this "well known" use of humanly perceptible metrics in a system for optimizing encoding of images.

Further, even assuming, arguendo, that some teaching of a

perceptual metric as representative of a prediction as to how a human eye would perceive a reconstructed image of an encoded image could be found in Yamaoka, the instant claims require the perceptual metric generator for determining a perceptual metric to use "a just noticeable difference map that represents the fidelity of an encoded image" and even the examiner admits that Yamaoka "does not explicitly provide for a JND map" [answer-page 8]. However, the examiner contends that since Yamaoka provides for a "difference" [presumably the subtraction results in response to which a decision circuit makes a decision of an optimum compression factor-column 4, lines 36-38], "there is no reason why the map of Yamaoka cannot be just noticeable" [answer-page 8].

The examiner's conclusion is but mere speculation which cannot be a proper basis for a rejection based on 35 U.S.C. 103. Merely because JND may have been known, this is no reason, per se, to suppose that it would have been obvious to employ this technique in the system of Yamaoka, without some suggestion in the prior art to do so. The "difference" in Yamaoka is not a "just noticed difference," as claimed. We note that the examiner reasons, at page 4 of the answer, that it would have been obvious "to use the conventional and well known concept of JND, since

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this can also be used as a parameter for high fidelity image compression..." [emphasis ours]. Merely because one could employ a certain conventional concept, does not necessarily make it obvious to do so, within the meaning of 35 U.S.C. 103.

None of the other applied references provides for these deficiencies in Yamaoka.

Accordingly, since it appears to us that the examiner has employed speculation, most likely as a result of hindsight gleaned from appellants' disclosure, in determining what is suggested by Yamaoka, we will not sustain the rejection of claims 1-4, 6-9, 11-14 and 16-18 under 35 U.S.C. 103.

The examiner's decision is reversed.

REVERSED

KENNETH W. HAIRSTON	)	
Administrative Patent Judge	)	
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	)	
	)	
	)	
ERROL A. KRASS	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
	)	
PARSHOTAM S. LALL	)	

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